

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 11980-5	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2004/015451	International filing date (day/month/year) 17/05/2004	(Earliest) Priority Date (day/month/year) 23/05/2003
Applicant CONTINENTAL PET TECHNOLOGIES, INC.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 05 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box II).

3. ☐ **Unity of invention is lacking** (see Box III).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regards to the drawings,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08K5/098 C08K5/01 B65D81/26 B32B27/18 B65D1/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08K B32B B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, CHEM ABS Data, BEILSTEIN Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 700 554 A (ROBERTS WILLIAM P ET AL) 23 December 1997 (1997-12-23)	36-38, 60-82, 84-87, 91-103, 107-115, 130-137, 139-143, 146-150, 156-160, 162,163
Y	column 3, line 23 - line 41 column 5, line 54 - line 59; example 2 claims 1,3,7-10,13-26	1-35

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

17 September 2004

Date of mailing of the international search report

11/10/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Russell, G

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 350 622 A (ROBERTS WILLIAM P ET AL) 27 September 1994 (1994-09-27)	36-38, 60-82, 84-87, 91-103, 107-115, 130-137, 139-143, 146-150, 156-160, 162,163
	examples 2,20 claims 1,4-8,11-16	
Y	-----	1-35
A	US 6 323 288 B1 (KATSUMOTO KIYOSHI ET AL) 27 November 2001 (2001-11-27) examples 42,43,45,46 claims	1-164

A	EP 1 253 171 A (TOYO SEIKAN KAISHA LTD) 30 October 2002 (2002-10-30) claims 1,3,8-10	1-164

A	WO 98/06779 A (CHEVRON CHEM CO) 19 February 1998 (1998-02-19) claims	1-164

A	DATABASE WPI Section Ch, Week 199314 Derwent Publications Ltd., London, GB; Class A14, AN 1993-112866 XP002296750 -& JP 05 051508 A (MONSANTO KASEI CO) 2 March 1993 (1993-03-02) abstract	1,36,85, 116,130, 164

A	US 4 041 005 A (TALSMA HERBERT ET AL) 9 August 1977 (1977-08-09) claim 6; example 4	1

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5700554	A	23-12-1997	US 5346644 A	13-09-1994
			AT 193717 T	15-06-2000
			AU 657728 B2	23-03-1995
			AU 1141092 A	08-10-1992
			BR 9201126 A	24-11-1992
			CA 2062083 A1	03-10-1992
			CS 9201000 A3	14-10-1992
			DE 69231138 D1	13-07-2000
			DE 69231138 T2	19-10-2000
			DK 507207 T3	07-08-2000
			EP 0507207 A2	07-10-1992
			ES 2148157 T3	16-10-2000
			FI 921425 A	03-10-1992
			HU 67219 A2	28-03-1995
			IE 921035 A1	07-10-1992
			IL 101161 A	14-05-1996
			JP 3183704 B2	09-07-2001
			JP 5115776 A	14-05-1993
			MX 9201379 A1	01-10-1992
			NO 921268 A	05-10-1992
			NZ 241802 A	22-12-1994
			PL 294050 A1	30-11-1992
			PL 172483 B1	30-09-1997
			RU 2092513 C1	10-10-1997
			US 5529833 A	25-06-1996
			US 5350622 A	27-09-1994
			ZA 9201914 A	16-09-1993
US 5350622	A	27-09-1994	US 5529833 A	25-06-1996
			AT 193717 T	15-06-2000
			AU 657728 B2	23-03-1995
			AU 1141092 A	08-10-1992
			BR 9201126 A	24-11-1992
			CA 2062083 A1	03-10-1992
			CS 9201000 A3	14-10-1992
			DE 69231138 D1	13-07-2000
			DE 69231138 T2	19-10-2000
			DK 507207 T3	07-08-2000
			EP 0507207 A2	07-10-1992
			ES 2148157 T3	16-10-2000
			FI 921425 A	03-10-1992
			HU 67219 A2	28-03-1995
			IE 921035 A1	07-10-1992
			IL 101161 A	14-05-1996
			JP 3183704 B2	09-07-2001
			JP 5115776 A	14-05-1993
			MX 9201379 A1	01-10-1992
			NO 921268 A	05-10-1992
			NZ 241802 A	22-12-1994
			PL 294050 A1	30-11-1992
			PL 172483 B1	30-09-1997
			RU 2092513 C1	10-10-1997
			US 5346644 A	13-09-1994
			US 5700554 A	23-12-1997
			ZA 9201914 A	16-09-1993
US 6323288	B1	27-11-2001	US 2003109643 A1	12-06-2003
			US 5736616 A	07-04-1998

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6323288	B1	US 5627239 A	06-05-1997
		US 5859145 A	12-01-1999
		AU 696208 B2	03-09-1998
		AU 3750797 A	20-11-1997
		AU 684810 B2	08-01-1998
		AU 7361094 A	13-02-1995
		CA 2144309 A1	26-01-1995
		DE 69410962 D1	16-07-1998
		DE 69410962 T2	08-10-1998
		DK 659195 T3	01-02-1999
		EP 0659195 A1	28-06-1995
		HK 1010814 A1	25-06-1999
		JP 8505183 T	04-06-1996
		NO 950926 A	04-05-1995
		NZ 269918 A	27-08-1996
		WO 9502616 A2	26-01-1995
EP 1253171	A 30-10-2002	AU 9714901 A	13-06-2002
		CA 2364882 A1	08-06-2002
		EP 1253171 A1	30-10-2002
		JP 2003012944 A	15-01-2003
		US 2002115768 A1	22-08-2002
		US 2004176536 A1	09-09-2004
WO 9806779	A 19-02-1998	US 5776361 A	07-07-1998
		AT 213752 T	15-03-2002
		AU 724159 B2	14-09-2000
		AU 3963597 A	06-03-1998
		CA 2262604 A1	19-02-1998
		DE 69710734 D1	04-04-2002
		DE 69710734 T2	28-11-2002
		DK 918818 T3	25-03-2002
		EP 0918818 A1	02-06-1999
		ES 2173469 T3	16-10-2002
		JP 2001507045 T	29-05-2001
		NO 990674 A	19-03-1999
		NZ 333921 A	26-05-2000
		PT 918818 T	30-08-2002
		WO 9806779 A1	19-02-1998
JP 5051508	A 02-03-1993	NONE	
US 4041005	A 09-08-1977	AT 349211 B	26-03-1979
		AT 12277 A	15-08-1978
		AU 503512 B2	06-09-1979
		AU 2100176 A	06-07-1978
		BE 850398 A1	02-05-1977
		CA 1073143 A1	04-03-1980
		DE 2659467 A1	28-07-1977
		DK 15877 A	16-07-1977
		FR 2338302 A1	12-08-1977
		GB 1567381 A	14-05-1980
		IT 1067023 B	12-03-1985
		JP 52087450 A	21-07-1977
		NL 7700273 A	19-07-1977
		SE 7700395 A	16-07-1977
		ZA 7607604 A	30-11-1977

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing

(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/US2004/015451

International filing date (day/month/year)
17.05.2004

Priority date (day/month/year)
23.05.2003

International Patent Classification (IPC) or both national classification and IPC
C08K5/098, C08K5/01, B65D81/26, B32B27/18, B65D1/02

Applicant
CONTINENTAL PET TECHNOLOGIES, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized Officer

Russell, G

Telephone No. +49 89 2399-8738



Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. II Priority

1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
- ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1- 35,39- 59,83, 88-90,104-106,116-129,138,144,145,151-155,161,164
	No: Claims	36- 38,60- 82,84-87, 91-103, 107-115,130-137,139-143,146-150,156-160,162,163
Inventive step (IS)	Yes: Claims	
	No: Claims	1-164
Industrial applicability (IA)	Yes: Claims	1-164
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re. Item V:

1. Relevant cited prior art:

- D1: US-A-5 700 554
- D2: US-A-5 350 622
- D3: US-B-6 323 288
- D4: EP-A-1 253 171
- D5: WO-A-98/06779
- D6: DATABASE WPI Section Ch, Week 199314 Derwent Publications Ltd., London, GB; Class A14, AN 1993-112866& JP-A-05 051508
- D7: US-A-4 041 005

2. Novelty and inventive step

- 2.1 D1 relates to compositions and packaging single or multi-layered articles for scavenging oxygen and especially to the protection of oxygen-sensitive products such as food. The said articles which may include walls of containers, bottle cap liners, and sealants, comprise at least one layer comprising (a) an ethylenically unsaturated hydrocarbon such as squalene, and (b) a transition metal catalyst such as cobalt neodecanoate (Abstract; column 3; claims 1, 3, 13, 14). Preferred ethylenically unsaturated hydrocarbons (a) comprise substituted or unsubstituted hydrocarbons having two or more ethylenically unsaturated groups per molecule, while preferred substituted ethylenically unsaturated hydrocarbons include those with oxygen-containing moieties, such as esters, carboxylic acids, aldehydes, ethers, ketones, alcohols, peroxides, and/or hydroperoxides (columns 3-4; claims 7-10), dehydrated castor oil being especially preferred (claim 4). An additional polymer diluent may be mixed with component (a), particularly thermoplastics, in an amount up to 99% (claims 17-19). The catalyst (b) is preferably a cobalt salt (column 4; claims 13, 14), present in an amount of 10 to 10.000 ppm based on the weight of (a) and (b) (column 6). Layers are made using, for example, (co)extrusion, injection moulding, and stretch blow moulding (column 5). Additional layers include oxygen barrier and adhesive layers. Examples 2 and 20 describe oxygen barrier films of poly(ethylene-vinyl acetate) and trans-polyisoprene, respectively, containing squalene [an alkenyl chain corresponding to =A being a C₁₇-alkenyl group in formula (I) of present claims 36, 85, and 130 of the specification], and cobalt catalyst.

D2 similarly describes multilayer structures useful in packaging food and beverage products comprising an oxygen barrier layer and oxygen scavenging layer, wherein the latter layer comprises an unsaturated hydrocarbon (e.g., squalene) and transition metal catalyst (claim 1; Exs. 2, 20).

Thus in view of the teachings of D1 and D2, the subject-matter of claims 36-38, 60-82, 84-87, 91-103, 107-115, 130-137, 139-143, 146-150, 156-160, 162, and 163 is not considered to be novel (Article 33(2) PCT) or inventive (Article 33(3) PCT).

- 2.2 Other disclosure D3 to D5 disclose oxygen scavenging compositions and oxygen barrier layers made therefrom, whereby ethylenically unsaturated (oxidizable) hydrocarbons are contained with cobalt catalysts in said barrier layers.

Compounds according to the formulae (II) or (I) of the current application are not disclosed.

- 2.3 The advantageous use of unsubstituted and substituted ethylenically saturated hydrocarbons to react with oxygen in the presence of a transition metal catalyst in oxygen barrier compositions and food packaging articles is known in the art. D1 and D2 can be best considered to represent the closest prior art, as they also aim at producing articles and film structures used for packaging oxygen sensitive products such as food. These citations teach that compounds containing ethylenic unsaturation react irreversibly with oxygen during the catalytically facilitated scavenging process.

The comparative data of the application (Table B; pg. 35) do not reflect the state of the art. The use of the structurally similar compounds given by the formulae (I) and (II) cannot be regarded to be worthy the recognition of an inventive step, since in view of their structural similarity with the known compounds of D1 or D2, the skilled person would have reasonably expected the same or similar usefulness as the means of solving the technical problem underlying the application.

Hence, the subject-matter of claims 1 to 164 is not considered to involve an inventive step (Article 33(3) PCT).

Re. Item VIII:

1. The use of the term "about" to delimit ranges of physical values in both description and claims renders said ranges unclear, and should be deleted (Article 6 PCT). The last paragraph on page 46 is irrelevant and should be deleted.